

PUBLIC PERCEPTION & CONCERN



The public have been subjected to media reports claiming alarming impacts on the environment, public health other industries and our clean green image.
This dramatic 7.30 report that claims the Pulp mill will taint our fish is just one of many sensational reports

Source ABC 7.30 report 5 June 2007 Reporter: Jocelyn Nettlefold

The effluent outfall pipeline will be an approximately 2.7 km long from the shore and 200 m long diffuser.

The outfall is proposed for an area approximately 25 m in depth.

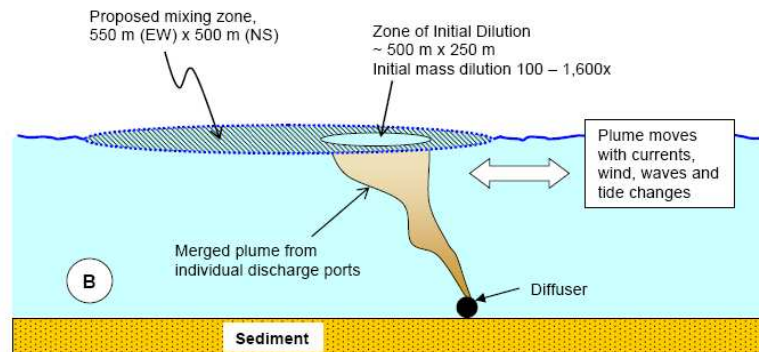
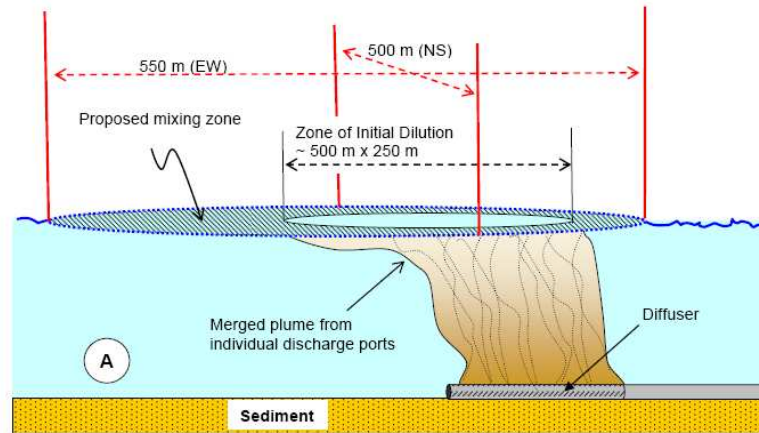


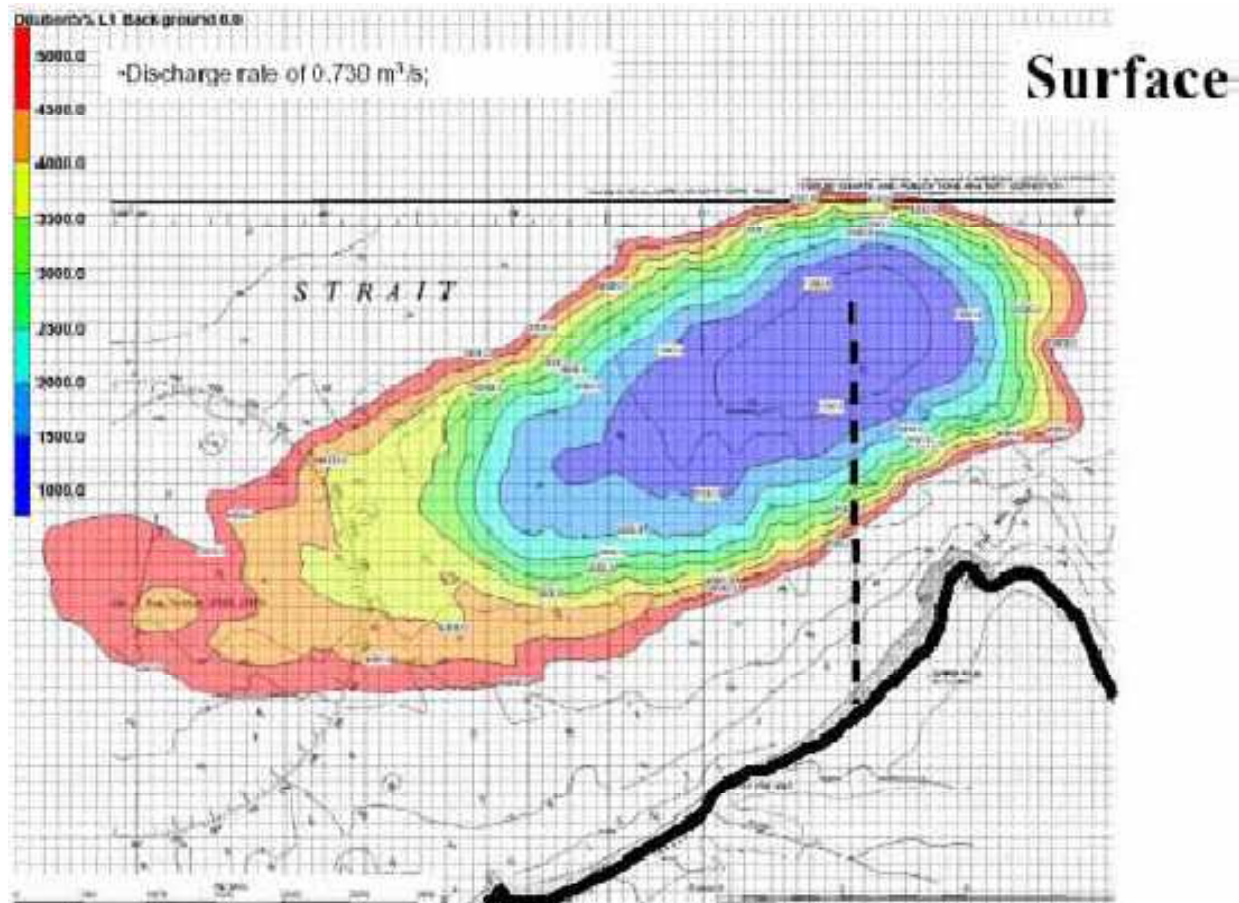
Figure 5.1: Schematic representation of zone of initial dilution & mixing zone.
A. Side view, B. End view
Figures are not to scale. Zone dimensions are as recommended in GHD (2006b).

Source: Marine Impact Assessment - Bell Bay Pulp Mill Effluent
Prepared for: Gunns Ltd.
Prepared by: Roger Drew and John Frangos, Principal Consultants, Toxikos Pty Ltd.
Toxikos Document: TR101006-RJF
23rd January 2007

The reality shows a much gentler process.

At the edge of the Zone of initial dilution the treated effluent is diluted by 1:100

Model of Dilution Contours



Source: Marine Impact Assessment - Bell Bay Pulp Mill Effluent Prepared for: Gunns Ltd. Prepared by: Roger Drew and John Frangos, Principal Consultants, Toxikos Pty Ltd. Toxikos Document: TR101006-RJF 23rd January 2007

Modelling of the treated effluent dispersal has been subject to much criticism. This map by GHD's experts shows surface dilution to from 1:100 out to 1:5000. It gives a good guide to how quickly the effluent concentration will be minimised quickly. The discharge rate of .73m³/s works out as 64,000 m³ per 24 hour day. Although we don't normally talk of the weight of fluid (e.g. rain is quoted in mm not Kg). This amount of treated effluent is reported in the media as 64,000 tonnes.

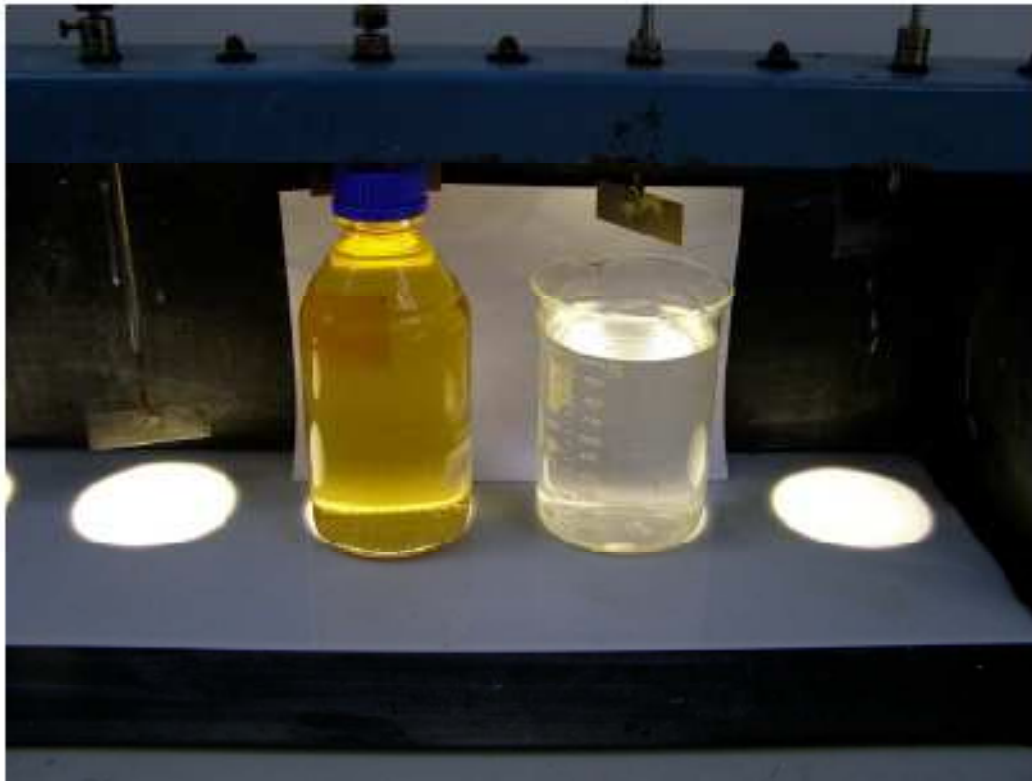
2004 RPDC recommended and the Government accepted the following guidelines for the Marine effluent

Parameter	Units	Monthly average maximum	Daily maximum
TSS	kg/ADt	2.6	4.5
BOD	kg/ADt	2.1	3.6
COD	kg/ADt	20	34
AOX	kg/ADt	0.2	0.4
Colour	kg/ADt	42	72

The content of the treated effluent must comply with these guidelines

Source: RPDC 2004 final guidelines

Figure 6-1 Comparison between biologically treated undiluted effluent (left) and same effluent after 100 times dilution with sea water (right).



Source Gunns
Ltd 2007

Example of the Treated Effluent's colour

Parameter	Units	Value
Acute toxicity	LC ₅₀ /EC ₅₀	See note in RPDC report
Chronic toxicity	EC ₅₀	See note in RPDC report
→ 2,3,7,8-TCDD	pg/L	10
→ 2,3,7,8-TCDF	pg/L	30
Chlorate	mg/L	10
Trihalomethanes including chloroform	mg/L	2
Oil and grease		No visible contamination

Dioxins were used to be of the most concern as marked, refer to next slides for a description of the guideline limits. The virtual elimination of dioxins has been the greatest environmental benefit in switching from bleaching with elemental chlorine (as in the 1980s & Wesley Vale days) to either ECF or TCF bleaching for kraft mills.

Regulatory limits for dioxins and furans

TAS (RPDC) = 10pg/L for 2,3,7,8-TCDD & 30pg/L for 2,3,7,8- TCDF
(Equivalent to 13pg TEQ/L)

US EPA = TCDD non-measurable at QL of 10pg, TCDF QL of 50 pg/L
(Equivalent to <13.1pg as total TEQ)

The limit is expressed as 10pg/L, this is a concentration of 10 parts per quadrillion.

It is the equivalent of measuring the concentration of salt after one salt grain has been put in the volume of 24 Olympic sized swimming pools.

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A grain of salt weighs approx $60\mu\text{g}$ i.e. $6 \times 10^{-5}\text{g}$,
the volume of an Olympic pool ($50\text{m} \times 25\text{m} \times 2\text{m}$)
is $2.5 \times 10^6 \text{ L}$.

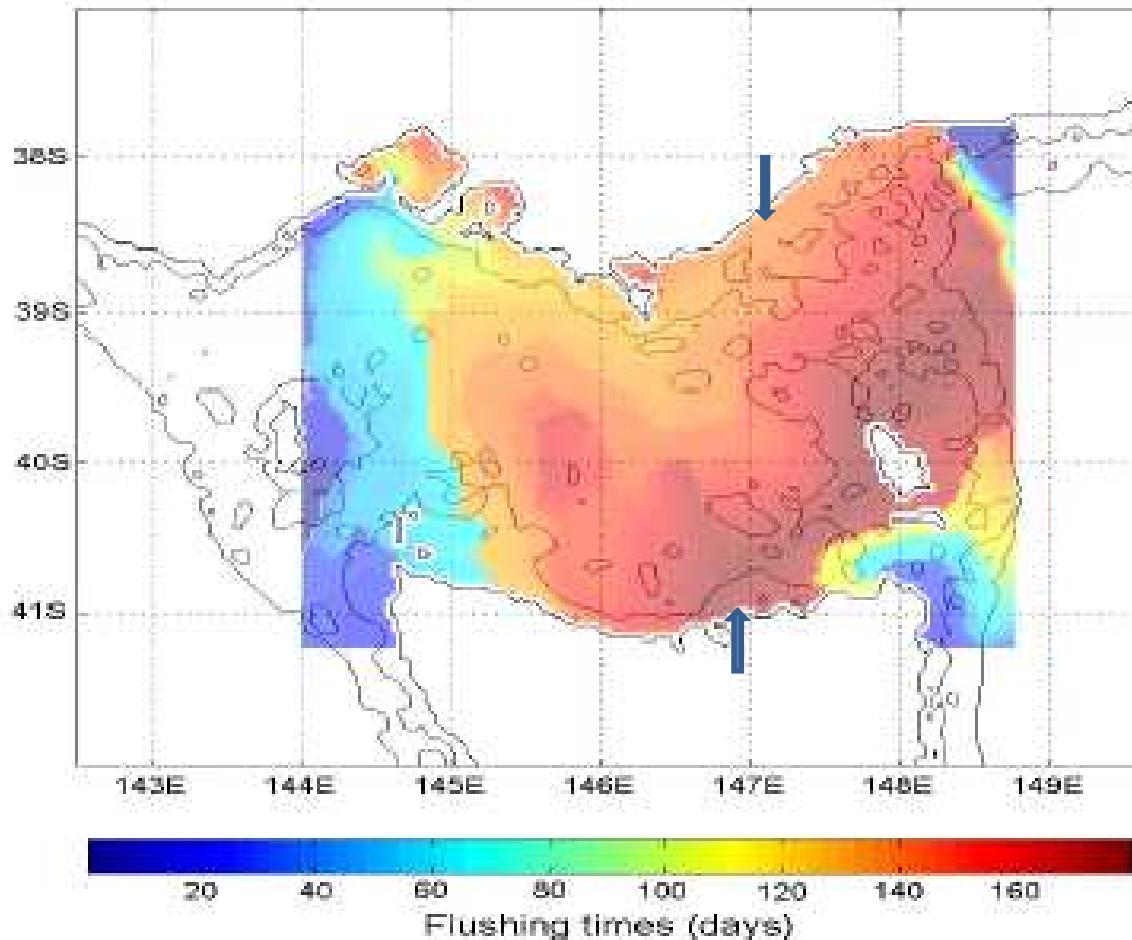
Hence the number of Olympic Swimming pools
 10pg/L (10^{-12} g/l) is $[6 \times 10^{-5} \div 10^{-12}] / 2.5 \times 10^6 = 24$.

While the mill will discharge an average of
approximately 24 thousand million litres (24 GL) of
treated effluent to Bass Strait each year,

the total amount of dioxin and furans discharged
with it each year is estimated to be only 0.074
grams

Flushing Times

Long flushing times don't mean the treated effluent isn't thoroughly diluted, the Victorian outfall with double the dioxin limit but less volume is not considered to have any significant impact on commonwealth Marine Waters



Arrows show outfall from pulp mills, the Victorian pipeline is from Maryvale via the Gippsland Waste Water System since the early 1990's

5 Mile Bluff

Sources: Flushing times: Sandery, P.A. and Kämpf, J., (2005). Winter-Spring Flushing of Bass Strait, South- Eastern Australia, A Numerical Modeling Study. Estuarine, Coastal and Shelf Science, 63: 23-31. Location of Delray Beach Outfall Gippsland Water